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War Vegetable Gardening

and the

Home Storage

of

Vegetables

PART I—WAR GARDENING MANUAL
PART II—HOME STORAGE MANUAL

1918

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National War Garden Commission

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PLAN OF GARDEN 50 by 75 feet, in which careful attention has been paid to proper rotation of the season's crops and to a continuous supply of the more important vegetables.

Hot Bed	Cold Frame	Asparagus	Rhubarb

ARRANGEMENT OF SEASON'S CROPS

Peas, followed by Tomatoes

Peas, followed by Celery

Onion Sets, followed by Turnips

Corn, followed by Spinach

Beans (bush), followed by Beets

Beets, ½ row; Carrots, ½ row, followed by Corn

Turnips, followed by Bush Beans

Potatoes, followed by Spinach

Spinach, followed by Potatoes

Cabbage, with Lettuce and Radishes between, followed by Carrots

Beans, Bush Lima

Chard, ¾ row; Parsley, ¼ row

Parsnips, ¾ row (radishes to mark row); Salsify, ¼ row

Corn, followed by Kohl-rabi, ½ row; Cauliflower, ½ row

Peas, followed by Corn

Beans, Bush Lima

Potatoes, followed by Cabbage

Tomatoes

Peppers, ½ row; Potatoes, ½ row

Potatoes

Potatoes

Pole Lima Beans

Pole Lima Beans

Corn

Corn

Corn

Cucumbers	Squash (bush crock neck)	Squash (winter)	Musk-melon

Rows are 30 inches apart. If soil is very fertile rows may be closer.

Planting was begun at hotbed end of garden and plantings were made a few days apart to insure a constant supply of vegetables. Planting table on Page 23.

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PART I.

WAR GARDENING MANUAL

As a result of wartime emergency the Home Garden of America has become an institution of world-wide importance. The planting and growing season of 1917 demonstrated that the products thus raised are essential to the feeding of the people of the United States and the Allied nations. Under the impetus given by the National War Garden Commission the people of this country last year produced a crop valued at $350,000,000 in gardens cultivated in backyards, on vacant lots and on other land previously untilled—the patriotic gift of the war gardens to the nation.

WAR GARDENS HELP SOLVE TRAFFIC PROBLEM.

The winter of 1917-1918 brought the most serious traffic congestion the United States has ever seen. This condition has no meaning more significant than that the gardens of this year must do even more than those of 1917 in freeing the overburdened railroads from the need for transporting food products. With food shortage threatening the allied nations and with railroad congestion as an added factor, the war garden results of the coming season must be several times greater even than the vast yield of last year.

COMMUNITY GARDENING.

Excellent results are obtained through co-operative gardening work. If several families join forces they can reduce the cost of gardening, in time, labor and money. Families having adjoining or neighboring garden plots may use one set of tools. To prevent clash of convenience it is well to have an understanding in advance as to the time when each gardener is to have the use of particular tools. By this arrangement it is possible to have complete equipment at expense much less than if each gardener bought his own. Money can also be saved in buying seeds, fertilizers and spraying materials by clubbing together and gaining advantage of the lower prices for large lots.

One of the advantages of doing community work is that it is possible for the gardeners interested in the project to employ a man and a team to prepare their gardens by plowing and harrowing. In this way the man and team can be kept busy throughout the day and the expense to each gardener will be slight.

On a larger scale this principle should be applied to garden plots on tracts of vacant land allotted to individuals in or near cities or towns. Each plot in such a tract is a separate garden, belonging to the individual or family to whom allotted. In many instances the municipal authorities, the mayor's war garden committee or some similar local organization, will provide an expert to supervise work on community gardens of this character. This expert will give advice and instructions as to preparation, planting and cultivation and on other technical subjects.

If an expert is not provided in this way it is wise for the gardeners to club together and arrange for one at their own expense, if the project is large enough to make this possible without too great individual cost. The help of an expert is of great value.

School children and parents may work together to good advantage on these garden plots. In some communities school authorities allow the children to spend a portion of the school hours on stated days, in their garden work. Through co-operation with street cleaning departments a municipal government may arrange to deliver manure to war gardeners at nominal cost. In at least one important city this is done at a charge of $2 per load.

Fig. 1—A community garden which produced excellent results in 1917. The ground was given by a manufacturing concern for the use of its employes and the plowing and harrowing were done by the company. Expert supervisors directed the work.

Manufacturing concerns and other enterprises which employ labor on a large scale, may make valuable contribution to the national food supply by encouraging their employes to cultivate war gardens. Many concerns furnish large tracts of land, which are divided into individual garden plots. These plots are allotted to such employes as are willing to cultivate them. Each plot and everything it produces are recognized as the individual property of its cultivator. The company bears the expense of plowing and fertilizing these plots and employs an expert to have charge.

It is a good plan for municipal governments to arrange for lectures at school houses or other places on practical problems in gardening.

HOW TO HAVE A GOOD GARDEN

Garden Plan

Have a plan for your garden—drawn to scale on paper—before you start, to give proper order in planting and enable you to buy the right amount of seeds in advance while the selection is good.

Put in one general group small plants like beets, onions, lettuce, carrots, radishes and parsnips. In another general group put larger plants like corn, tomatoes and potatoes. Spreading ground vines, like melons and cucumbers, which need wider spacing, should be put in another general group. The reason for this grouping is that the various plants in a group need similar general treatment as well as spacing.

In making a plan provide space in which to enter costs and yield on the various crops. This will give you a complete record which will be useful another year. Another helpful use of the plan is that it will guide you in the rotation of next year's crops. For this purpose save your plan for next season

In planning your garden formulate some definite plan as to what you will do with surplus vegetables. Detailed instructions for home storage of vegetables for winter use are given in Part II of this booklet. Detailed instructions for canning, drying, pickling and other forms of conservation are given in the Home Manual on these subjects issued by this Commission.

Sunshine.

In the location of a garden it is not always possible to choose conditions as to sunlight. It is important, therefore, that in the arrangement of the various varieties of vegetables which are to be planted, due care should be given to providing the greatest exposure to the sun for those crops which need it most. Those plants which must ripen their fruits, such as tomatoes and eggplant, require the greatest amount of sunshine, while lettuce, spinach, kale and other leaf crops require relatively less. Even these latter, however, should have at least 2 to 3 hours a day.

Vary From Last Year's Plan.

It is important to remember that plant diseases and insects are apt to thrive in a spot in which they have become established.

For this reason those who make gardens this year should take care not to place the individual crops in the spot in which the same crops grew last year. Varying the arrangement of the garden in this way will reduce the danger from diseases and insects.

SURPLUS PRODUCTS.

At times, even with the best of planning, a gardener will find that his garden has matured more of some varieties of vegetables than can be used immediately. None of this excess should be wasted and there is no occasion for waste. If there is no ready market for the surplus it should be prepared for winter by either canning or drying. By modern methods either canning or drying may be done with little expense of time, trouble or financial outlay. By using the cold-pack method as small a quantity as a single can or jar may be put up in a short time. With proper instructions it is possible for the housewife to dry a handful of peas or beans, sweet corn, a few sweet potatoes or turnips or small quantities of many other vegetables with practically no expenditure of her time. Explicit and simple directions for canning and drying are given in the Manual issued by the National War Garden Commission.

THE SOIL AND MANURES.

The back yard gardener must use the soil he has, but he can improve it if it is poor, and he must do this as far as possible. Stable manure will help even the richest soil, and you are not likely to use too much of it During a single season professional gardeners apply as much as six inches of it. From 400 to 600 pounds can be used to advantage on a plot 20 by 20 feet. Coarse manure should be applied and thoroughly plowed or spaded under in the fall. In the spring, fine, rotted manure is applied, just before plowing or spading preceding the planting of any crop. If the ground is fairly rich and well rotted manure is scarce, the manure may be scattered in the row only, and should be mixed into the soil before the planting of seed.

Loam is the best garden soil. Sand, with manure gives good results. Clay is hardest to work, but is greatly improved by well rotted manure and vegetable matter—called humus. These should be well worked in with hoe and rake. Sifted coal ashes, entirely free from clinkers, will help loosen up clay when mixed into it, but will not remove an acid condition nor increase fertility.

Commercial Fertilizer.

Many gardeners experience difficulty in obtaining supplies of well-rotted manure In such cases commercial fertilizers should be used. Even where stable manure has been secured and worked into the soil it is well to supplement with moderate quantities of quick-acting fertilizer in order to give plants an early start and hasten maturity.

It is safest to rely upon the ready-mixed fertilizers usually obtainable at seed and hardware stores. Several specially prepared mixtures in convenient packages are now on the market. For large areas, 100 to 200-pound bags may be obtained. A mixture containing 3 to 4 per cent nitrogen and 8 to 10 per cent phosphoric acid is about right for the average garden. Your dealer will inform you on this point. If the fertilizer also contains potash, so much the better, but this year potash is scarce and high in price.

Where no manure is used the fertilizer should be spread over the surface of the finely prepared seed-bed at the rate of 5 pounds for a plot 10 feet square, just before planting. The surface soil should then be thoroughly raked so as to mix the fertilizer evenly to a depth of 2 inches. Never place seed or transplanted plants in direct contact with fertilizer. Thorough mixing of the fertilizer with the soil is essential to prevent injury of seed or roots.

Where manure has been worked into the soil, reduce the fertilizer application approximately one-half.

Tomatoes, eggplants, potatoes, spinach and some other crops requiring rather long growing seasons, are materially benefited by a second application of fertilizer when half grown. Side dressings of this kind should be scattered between the rows at the rate of four ounces (one-half pint) to 10 feet of row, when rows are spaced 2 feet apart; and pro rata for rows spaced a greater or lesser distance. To insure

even distribution mix the fertilizer with fine, dry earth just before spreading.

Compost.

Compost is especially desirable when quick growth is wanted. Compost is thoroughly rotted manure or organic material. It is prepared from six to twelve months before being used, by putting the manure and other material in piles having perpendicular sides and flat tops. These piles are usually from 2 to 4 feet high and 6 to 8 feet long.

Besides the usual waste of garden rubbish, there is a large waste of leaves, weeds and the skins and other unused portions of fruits and vegetables. These should all be thrown on the compost pile to decay for use on the garden next spring.

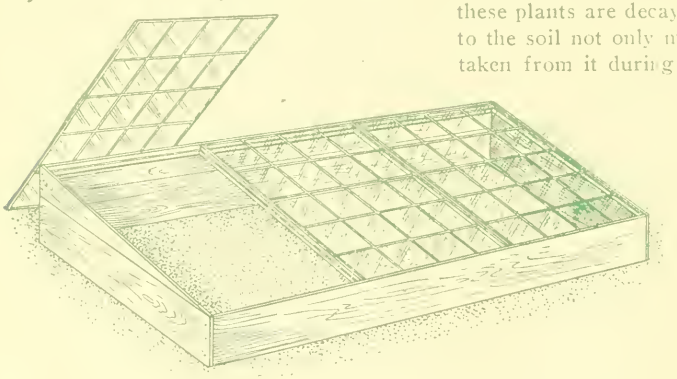


Fig. 2—This shows the construction of an outdoor cold frame. A hot bed built in the same way, except that for the hot bed a pit and manure are required. See pages 7 and 8.

Destroy all plants which are diseased. The compost pile should be built up in alternate layers of vegetable refuse a foot thick and earth an inch or more thick. The earth helps to rot the vegetable matter when mixed with it. The top of the pile should be left flat so the rain may enter and help in the process of decay.

If the pile can be forked over once a month when not frozen and the contents well mixed together, they will decay quite rapidly and be in good usable condition in the spring. The compost may be either spread over the garden and plowed under or it may be scattered in the rows before the seeds are sown. This is, of course, not as rich as stable manure, but it is a good substitute.

Compost is also used as a top dressing during the growing season for hastening growth.

In the cities and towns tons of leaves are burned every fall. This is a loss which ought to be prevented. These leaves properly composted with other vegetable waste and earth would be worth hundreds of dollars to the gardens next spring.

In planning a permanent garden, a space should be reserved near the hot bed or seed bed, and in this space should be piled, as soon as pulled, all plants which are free from diseases and insects. This applies to all vegetables and especially to peas and beans, as these belong to a group of plants which take nitrogen from the air, during growth, and store it in their roots. When these plants are decayed they will return to to the soil not only much of the plant food taken from it during their growth but additional nitrogen as well. Nitrogen in the soil is necessary for satisfactory leaf growth. The material so composted should be allowed to decay throughout the winter, and when needed should be used according to the instructions given for using compost. The sweepings of pigeon lofts or chicken coops make valuable fertilizer.

Prepared sheep manure, where procurable at a reasonable price, is possibly the safest concentrated fertilizer. It should be used in small quantities rather than spread broadcast. Scatter it along the row before seed is sown or apply by mixing it with water in a pail, stirring the mixture to the consistency of thin mush, and pouring it around the roots of the plants.

Green Manure.

Green manure is useful as a fertilizer. It consists of green plants turned under by plowing or spading. Rye is the most satisfactory for this purpose. If planted in

July or August the crop may be turned under in the fall if early spring planting is desired. If planted later, it is usually turned under in the spring. When not turned under until spring the growth will prevent the leaching of soluble plant food or the washing away of rich soil.

In sowing rye for this purpose, use at the rate of 1 pound of seed to a strip of ground 50 feet long and 10 feet wide. If the ground is rough or hard it should be cultivated just before the seed is sown, and then cultivated again to cover the seed. Sow the seed between the rows of crops not yet gathered. Rye is very hardy and will sprout even though there is frost nearly every night. At a cost of about 5 cents for a pound of seed a garden of 10 by 50 feet can thus be treated to an application of green manure. The green rye plants soon decay when turned under and answer the same purpose as a light dressing of manure.

Green manure should not be relied upon to do the work of stable manure.

Lime.

Land which has long been unused or land in lawns, is apt to be sour. To remedy this condition apply evenly 1 pound of air-slaked lime or 2 pounds of ground limestone to every 30 square feet. The lime should be applied and raked in to a depth of 2 inches when the seed bed is being prepared in the spring. Instead of lime 2 pounds of unleached wood ashes may be used.

Fig. 3—Wheel hoe or hand cultivator. This can be had with various attachments, such as plow, cultivator teeth, shovels and rake. A simple form may be made at home

OUTDOOR HOTBEDS.

For early planting a hotbed may be made, located in a sheltered spot with southern exposure, where it will receive a generous supply of sun. A width of 6 feet is desirable and the length should be such as will enable the use of standard 3 by 6 foot hotbed sash. A simple, boxlike frame, 12 inches high in the rear and 8 inches high in front, will hold the sash and give a better angle for the rays of the sun.

Dig a pit 1½ to 2 feet deep, the size of the sash frame to be used. Line the sides of this with boards or planks, brick or concrete, and make a tile drain, or place stones on the bottom of the pit, to carry off surplus water. This pit is to be filled with fresh horse manure. The manure will require special treatment before being placed in the pit. It should be thrown into a pile and allowed to heat. When it has heated and is steaming fork it over into a new pile, throwing the outside material into the center. When the new pile has become well heated fork the material once more into a new pile. This will require from ten days to two weeks and is important in that it gets rid of excessive heat. After this process fill the pit with the manure, packed down firmly and evenly, level with the surface of the surrounding earth. On top of this manure make a covering of good garden loam 3 or 4 inches deep.

When the sash have been put in place the manure will generate heat, in addition to the heat that will be derived from the sun. After this heat has reached its highest point and dropped back to between 80 and 90 degrees F. the seeds should be planted. Use the best seeds obtainable. Until the seeds germinate the hotbed should be kept shaded to hold moisture. This can be done by spreading over the sash strips of old carpet, heavy cloth or newspapers. After germination strong light will be needed. The plants must be watered each morning on clear days, and the sash left partially open for ventilation, as it is necessary to dry the foliage to prevent mildew.

Proper ventilation is essential to the production of strong, healthy plants. The sash should be raised during the warmest part of the day on the side opposite the

direction from which the wind is blowing. By opening it in this way instead of facing the wind, the hotbed receives fresh air without receiving the direct wind. On cold days raise the sash slightly three or four times for a few minutes only. In severe weather cover the beds with mats, straw or manure to keep in as much heat as possible. About two weeks before transplanting time the sash should be removed during the day to "harden" plants. While in the hot bed the plants should be thoroughly watered but the water should not reach the manure underneath. Early morning is the best time for watering, so that the plants will be dried before night.

An outdoor hotbed of this character should be started in the early spring—February or March.

THE COLD FRAME.

A cold frame is useful for hardening plants which have been started in the hotbed. It is built like a hotbed, but without the pit or manure. It is built on the surface of the ground. Good, rich soil should be used and the soil kept slightly moist. In mild climates the cold frame may be used instead of a hotbed for starting plants. It is also used in the fall and early winter for growing lettuce, radishes, carrots, parsley, etc.

TOOLS.

Not many implements are required for home gardening. The essentials are a spade or a garden fork, a hoe, a rake with steel teeth, a trowel, a dibble or pointed stick and a line such as is used by masons, or a piece of common string or cord, to stretch between two stakes for marking off rows. In the case of hard packed earth a pick is useful for digging. For watering, a rubber hose is needed where pipe connections are available. Lacking this equipment a watering pot should be provided. A hand cultivator or wheel hoe is useful, especially in a large garden, and saves much time and labor in turning small furrows. With simple attachments it is used for stirring the soil and the removal of weeds.

PREPARATION OF SOIL.

After the frost goes out test the ground by squeezing a handful of it. If it crumbles the soil is ready for spading. If it packs into a mud ball, the ground is still too wet and must not be worked.

Spade deeply, 8 to 15 inches, unless this latter depth turns up poor soil and buries the richer soil of the top. Pulverize the dirt deeply with hoe, spade and rake, breaking all clods on the surface. If a lawn roller is available it is useful for crushing hard clods. All vegetable growth on the surface, such as grass or weeds, should be turned under, to rot and enrich the soil. This is especially important with ground that has had a growth of turf.

SELECTION OF CROPS.

The home garden campaign for 1918 should be planned with a view to the production of the largest possible amount of food with the smallest possible outlay of seed and fertilizer. Authorities agree that the seed shortage is the worst the country has ever seen. The supply of fertilizers and natural manures is also far below the normal. The demand for these materials is exceedingly great and wartime efficiency makes it vital that wartime conservation be practiced in the use of them. To this end the war gardens of 1918 should be devoted as far as possible to those crops which are most useful for food and in which the chances of failure are least to be feared.

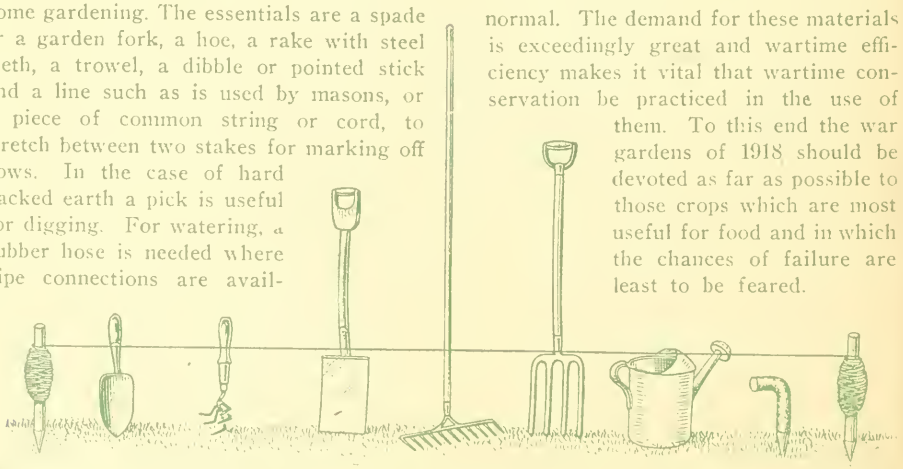


Fig. 4—Tools and implements most commonly needed in a small garden. From left to right, between the balls of cord, they are: Trowel, weeder, spade, steel toothed rake, garden fork, watering pot and dibble.

In the selection of vegetables for the home garden preference should be given to those having high food values. In the order of food value some of the best-known vegetables are: Beans, peas, corn, potatoes, parsnips, onions, beets, carrots, squash, greens, turnips, cabbage, cauliflower, radishes, tomatoes and celery.

Cauliflower, muskmelons, watermelons, onions from seed, asparagus and cucumbers are some of the plants that are most difficult to raise and are not recommended to the amateur gardener.

Soils vary so much that serious attention should be given to the crops suited to the individual garden. This is a local question. Consult your local war garden committee's experts as to the best crops for your particular soil.

In many communities last year witnessed an over-production of some vegetables that had to be used during the growing season. Many gardeners had larger crops of these than they could possibly use. Much waste resulted. To prevent this loss in seed, fertilizer, garden space, labor and foodstuffs every gardener should give especial attention to the selection of crops. Plant sparingly of those things which must be used as they mature and plant liberally of those things which may be saved for winter use by canning, drying or storing

PROCURE SEEDS EARLY.

Seed shortage was a handicap to many gardeners last year. In 1918 the planting of war gardens will be vastly increased and the demand for seeds even greater than in

Fig. 5—Use an envelope for sowing seed. The picture shows seed already sown in some of the rows in the seed box.

1917. It is important, therefore, that the home gardener should procure his supply of seeds early—well in advance of planting time. Be sure to patronize a reliable dealer, as quality is vital.

Use Seed Sparingly.

Home gardeners often plant seed thickly to make sure of a good stand. This is a wasteful method, excepting with such vegetables as will produce young plants which may be used as greens. The better way is to plant according to the directions given in the planting table.

The pronounced seed shortage this year makes it imperative that no seed be wasted.

HOW MUCH SEED TO BUY.

The following amounts of seed will plant in each case a garden row 100 feet long. Measure your rows and buy accordingly. Also compare your figures with planting table on page 23.

String beans	½ to 1 pint	Eggplant	1-3 ounce
Lima beans	½ to 1 pint	Kale, or Swiss chard	½ ounce
Cabbage	¼ ounce	Parsley	¼ ounce
Carrot	1 ounce	Parsnip	½ ounce
Cauliflower	1 packet	Vegetable oyster (salsify)	½ ounce
Celery	¼ ounce	Onion sets (bulbs)	1 quart
All squash	½ ounce	Onion seed	1 ounce
Beets	2 ounces	Peas	1 to 2 pints
Sweet corn	½ pint	Radish	1 ounce
Lettuce	½ ounce	Spinach	1 ounce
Muskmelon	½ ounce	Tomatoes	⅛ ounce
Cucumber	½ ounce	Turnip	½ ounce

1 or 2 pecks of early potatoes and ½ to 1 bushel of late potatoes are enough to plant to supply four persons

Testing Seeds.

A simple test will give useful advance information of the germinating value of seeds. This test is useful as enabling the gardener to determine whether or not seeds have been properly cured and are otherwise in good condition. Seeds which are too old or have been kept under unfavorable conditions are unsatisfactory.

To test, plant 100 seeds of each variety in an indoor seed box or in a hot bed. When these have germinated count the

seedlings which appear. The number of seedlings from 100 seeds will show the percentage of germination.

The planted seeds must be kept warm and moist during the test.

The seedlings should be kept for transplanting as this will prevent waste.

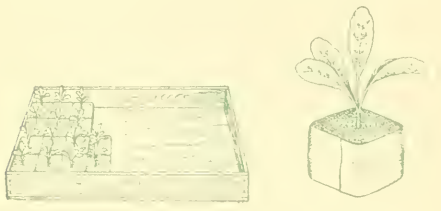


Fig. 6—A paper band folded into the form of a berry box, without bottom, is a good holder for indoor seed planting. The picture shows how these are placed side by side in a flat box.

The standard adopted by the United States Department of Agriculture for seed germination is as follows:

SHOULD PRODUCE 60 TO 80 PER CENT.
Celery, Parsley, Salsify, Eggplant, Parsnip

SHOULD PRODUCE 80 TO 85 PER CENT:
Asparagus, Okra, Spinach, Carrot, Onion, Cauliflower, Pepper.

SHOULD PRODUCE 85 TO 90 PER CENT:
Corn (sweet), Lettuce, Squash, Cress, Melon, Tomato, Cucumber, Pumpkin.

SHOULD PRODUCE 90 TO 95 PER CENT:
Bean, Mustard, Turnip, Cabbage, Pea, Radish.

INDOOR PLANTING.

Earlier crops can be secured by planting certain seeds indoors and setting the young plants out in the open garden after the weather becomes warm. This may be done

Fig. 8—Suggestion for a seed box for starting plants indoors.

with tomatoes, cabbage, lettuce, cauliflower, peppers, and eggplant.

Any wooden box, shallow and wide, will make an indoor garden. Put 1 inch of gravel or cinders in the bottom for drainage, and fill to the top with good soil. Rows of plants may be 2 inches apart.

Plant 8 or 10 seeds to the inch, keep the soil damp, and set the box in a window. When the plants are an inch high transplant them to other seed boxes, spacing plants 2 inches apart. This insures sturdy plants with good root systems.

Transplanting.

Before transplanting the plants to the garden set the box outdoors, in mild weather, to harden the plants. Set out each plant with a ball of the box dirt sticking to the roots. Thorough watering several hours before transplanting causes the earth to stick as required.

If the root system is broken in the removal trim away some of the larger leaves of the plants. In moist ground open a hole

Fig. 7—How a tomato plant is transplanted from pot to garden.

with trowel or dibble. Make the hole larger than is needed to hold the roots and a little deeper than the roots grew. Place roots in hole, and, with the hands, pack the soil firmly around the plant. In dry soil pour a pint of water into each hole before inserting plant. Rake some dry earth about the surface surrounding each plant to hold the moisture.

Transplanted plants cannot stand strong sunshine at first and cloudy days or late afternoon are preferable for transplanting. In bright weather place newspapers over them for a day or two, making tents of the papers, in the shape of an inverted V.

A homemade paper pot, a round, bottomless paper band or a berry box, filled with soil may be used to produce plants

for a hill of beans, cucumbers, sweet corn, melons or other plants which are started indoors. In transplanting these plants merely remove the bottom, if there is one, and sink frame and plants in the garden soil. This prevents disturbing the root systems, which is important

WHEN TO PLANT.

When heavy frosts are over, plant early peas, onion sets and seed, early potatoes, kale, lettuce and spinach. All of these will stand light freezing except potato plants, which must be covered with dirt when frost threatens.

When frosts are about over plant radishes, parsnips, carrots, beets, late peas and early sweet corn, and set out cabbage and cauliflower plants. (An old and useful rule is to "plant corn when the oak leaves are the size of a squirrel's ear").

When all frosts are over and apple trees are in bud, plant string beans and late sweet corn, and set out a few early tomato plants from the indoor boxes.

When apple trees blossom plant cucumbers, melons, squashes, lima beans and set out the rest of the indoor plants.

SEED BEDS.

Plants for second crops may be raised in a seed bed occupying small space. These plants may be grown while the space allotted to them in the garden plan is still in use for earlier crops. The rows of seed are not spaced so closely as in boxes used inside the house. If the plants crowd each other too much some of them may be removed and transplanted to another part of the garden. The seed bed plan is useful for such crops as cauliflower, Brussels sprouts, late cabbage and the like.

FALL PLANTING.

It is well to plant a fall garden of some crops, for in spite of the risk of injury by early frost the chances are in favor of satisfactory results. There can be no absolute rule as to the time of planting. The probable time of the first frost in each locality must be taken as a general guide. For planting in August, and possibly even in early September, the following vegetables may be grown:

When first frost may be expected between September 15 and September 25:

Lettuce, Spinach, Turnips, Parsley, Multiplier Onions and Turnips. (Kale and Radishes may be risked).

When first frost may be expected between September 20 and October 5:

Kale, Lettuce, Parsley, Multiplier Onions, Radishes, Spinach and Turnips. Beets and Chard for greens.

When first frost may be expected between October 5 and October 15:

Beets for canning, Carrots, Kale, Multiplier Onions, Spinach, Chard, Endive, Lettuce, Radishes and Turnips

When first frost may be expected between October 15 and October 25:

Any of the vegetables mentioned in the preceding lists. (String beans may be risked).

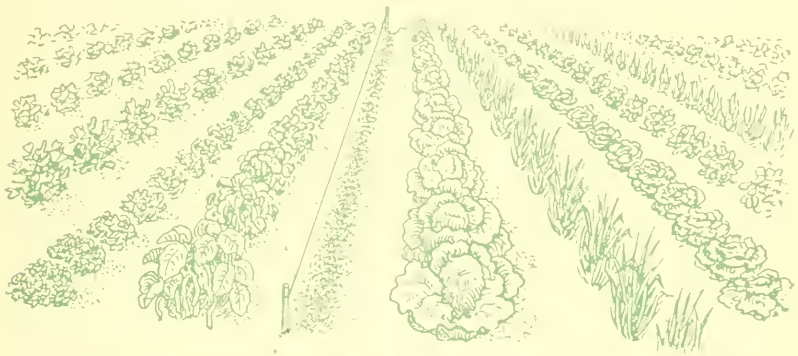


Fig. 9—Straight rows add to the beauty of the garden and are easier to cultivate. The simplest way to lay them off is to stretch a line between two stakes and mark row with a hoe, hoe handle or stick.

LAYING OFF ROWS.

Straight rows add to the garden's beauty and make cultivation easier. To make the rows straight stretch a stout string be-

tween stakes and follow it with the point of a hoe, with a wheel hoe, or with the end of the handle of a rake or hoe, to open up the row. The plan is suggested in Fig. 9.

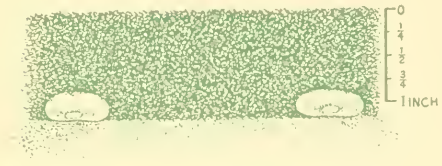


Fig. 10—Beans planted properly.

SUCCESSION OF CROPS.

Nature generously provides for more than one crop on the same soil. Vegetables which reach maturity early in the season should be followed by later crops of the same vegetable or by rotation of other kinds. Onions to be used green may be grown in rows which are to be occupied by late tomato plants, as a few of the onions may be removed to plant the tomatoes. Radishes mature early and as they are harvested the space may be used for cabbage, lettuce, cauliflower, Brussels sprouts and other plants. Many combinations of this kind may be made.

FOR CONTINUOUS CROPS.

With some of the important vegetables a series of plantings is desirable. Of string beans, lettuce, radishes, spinach, sweet corn, peas, beets and carrots there should be several successive plantings, two or three weeks apart, to provide a fresh and continuous supply all season.

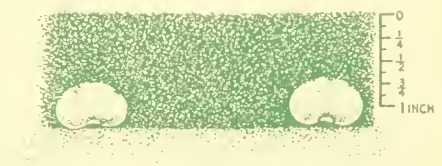


Fig. 11—Lima beans, planted properly. Note position of eyes.

DEPTH OF PLANTING.

Do not plant too deeply. The old rule is to plant to a depth of 5 times the size of the seed. This, however, is not an absolute rule and is not safe in all cases. **Consult planting table on page 23 for depth.**

HOEING.

When the green rows appear it is time to start hoeing or cultivating. Never hoe or cultivate deeply—an inch or two is deep enough—but stir the ground frequently, and always after rain or watering, as soon as it is dry enough. The hoeing must not be done after rain or watering when the ground is still so wet as to cause the muddy earth to pack like cement, as this causes the earth to cake and dry out rapidly.

Frequent hoeing causes the formation of a dust layer which prevents the soil underneath from drying out. The garden should always be kept free from weeds, as these, if permitted to grow, consume plant food and moisture needed by the plants.

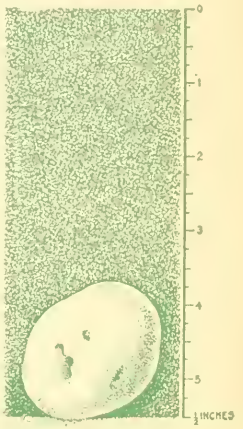


Fig. 12—A small potato planted whole. The depth of planting here shown is approximately 4½ inches to the center of the potato. This is the depth for late potatoes. Early potatoes are planted 2 inches nearer surface.

WATERING.

A plentiful supply of moisture is essential. If there is not sufficient rainfall the moisture must be provided by watering the garden. In doing this it is better to soak the ground once a week than to water every day. Late afternoon is the best time.

To moisten the surface is not enough. There must be a thorough wetting. If pipe connections are available a garden hose is the best means of watering. One of the most satisfactory methods is to open small furrows between rows and allow water to run into these trenches, raking the earth back into place several hours later, after the water has thoroughly soaked in. The sprinkling pot will serve if hose is not available, but it is more laborious.

DIRECTIONS FOR VEGETABLE GROWING.

POTATOES.

As one of the staple needs of the household Potatoes are entitled to special attention in Home Gardening and Community Gardening. In selecting for seed it is desirable to choose medium to large, smooth, shallow eyed potatoes. The best seed will produce the best crop. Potatoes grow best in sandy loam or in a gravel loam Heavy, sticky clay or loose sand is not desirable soil. Potatoes should not be grown in the same place in the garden in which they were grown the previous year. A rotation of three or four years is desirable.

Preparation of the soil should be done with care. The ground should be worked with plow, spade and hoe, to a depth of 8 or 10 inches, and should be thoroughly broken up or pulverized, then thoroughly worked with a steel-toothed rake. This preparation is of great importance and should not be slighted.

Treat Seed for Scab.

One of the most common diseases affecting seed potatoes is scab. This attacks the skin of the potato, causing it to thicken, and giving it a scabby appearance. It is carried through the winter in soil, in manure and on the potatoes themselves. To control this affection it is important that potatoes should be rotated with other crops as to location, and the same soil not used for potatoes except at intervals of three or four years. A simple remedy, easily applied, is to soak the seed potatoes before planting, in a solution of formalin and water. This solution is made of 1 ounce of Formalin (40 per cent formaldehyde), mixed in 2 gallons of water. In this mixture soak the uncut potatoe for two hours, and spread them out to dry. The solution can be used on as many lots of potatoes as desired.

Seed potatoes should be spread out in a room in which they will be exposed to strong light for two weeks before cutting, to start sprouts and detect poor seed. If large potatoes are used cut them into pieces weighing from 1 to 2 ounces, each piece having two eyes. If potatoes are scarce and expensive the pieces may be cut to a single eye Do not cut the seed until it is to be planted

Fig. 13—Lima bean vine on pole.

Planting.

For planting, prepare trenches or furrows from 3 to 5 inches deep and from 21 to 36 inches apart. Plant seed pieces 3 inches deep for early potatoes and 5 inches for late varieties The seed pieces should be 14 to 18 inches apart in rows, the smaller the pieces the closer the planting. Fill the trench with dirt, firming it in order that the moisture may be brought in contact with the seed pieces to assist in the process of germination.

Usually potatoes should not be planted as late as the first week in July very far north of the Mason and Dixon line except in sections where it is known that they will mature before freezing weather arrives.

Cultivation.

As soon as the potato plants come up begin cultivating them. The cultiva-

tion should begin before they come up if a crust forms. This crust should be broken with a rake or weeder. Cultivate half a dozen times during the season, to keep the surface in good condition. When the plants are young work the soil up around them to support the plants.

Potatoes are subject to diseases and insects which are scheduled on page 22. Take precautions to keep these from getting a

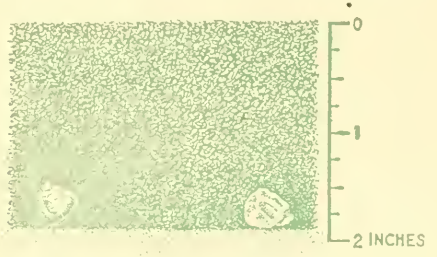


Fig. 14—Corn, planted properly, at a depth of 2 inches.

start. Follow instructions as to spraying and keep at it during the season. It is better to spray before trouble appears than to take chances.

Except for immediate use potatoes should not be dug while the skin is so tender that it can be rubbed off.

SWEET POTATOES.

Sweet potatoes are grown mostly in the Southern States or where there is warm, sandy soil, and are not especially recommended for the home garden. If space permits a few plants may be grown.

If you wish to grow your own plants start a hotbed about six weeks before apple-blossom time. Place 5 or 6 inches of sand over the manure in the hotbed and lay down small, healthy sweet potatoes, close together but not touching. Cover them with one or two inches of sand; water occasionally to keep slightly moist. Sprouts will soon begin to grow and immediately send out roots into the sand. When these sprouts are four or more inches long they may be pulled from the potatoes and are rooted and ready to be planted. They need not be pulled, however, until time to plant them in the garden, when all danger of frost is past. They should be set 14 inches apart in rows 36 to 60 inches apart. If only a few plants are wanted they should be purchased from a seedsman, as the trouble involved in growing them in small quantities is too great to make it worth while.

On land which is not thoroughly drained the plants should be set on ridges and these should be made broad, as narrow ridges will dry out too rapidly. The ridges should be maintained during the entire growing season.

Sweet potatoes should be dug when the soil is dry and the weather bright, before there is danger of hard frosts. A spading fork may be used in digging them. Guard against bruising or injuring them in digging and handling. Let the roots lie out to dry for two or three hours after digging.

Asparagus.

Use strong plants two years old, which may be purchased from seedsmen. Set them 18 inches apart, in rows 3 feet apart. The rows should be 8 to 10 inches deep, with width of 6 to 8 inches at bottom. After spreading out roots cover crowns with 2 inches of soil. With the growth of the shoots gradually fill in with earth until level with surface. Careful cultivation is required during season.

The cultivation of Asparagus is not recommended to home gardeners, as the first year's results are too small to make it worth while.

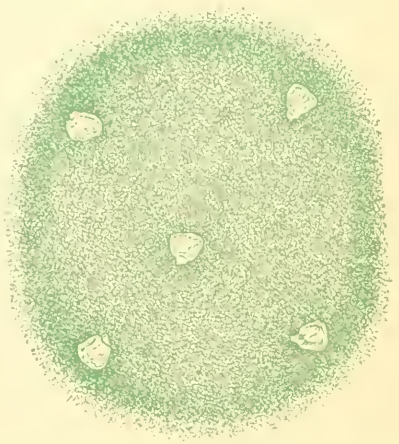


Fig. 15—Corn, planted properly in hill, at a depth of 2 inches and with corner kernels 3 inches apart.

Beans.

String and lima beans are grown alike. There are two sorts of each—low bush

vines and bean vines that climb poles. Pole beans are best for small gardens.

Plant beans and brush Limas 1 inch deep, 4 to 6 inches apart in rows.

Plant pole beans and pole Limas in hills 1 inch deep, 4 seeds to hill, hills 3 feet apart. Thin to 2 plants to the hill. Before planting fix firmly in each hill a pole 5 to 6 feet long. If desired have two rows of hills and slant the poles so that each set of 4 many be tied together at the top like an Indian tepee.

Help the vines to start twining around the poles from right to left.

Note: Plant lima beans with the "eyes" of the seeds downward

Beets.

Sow seed rather thickly in row, but thin the young plants by pulling until the survivors are 4 inches apart. The pulled plants make fine greens for cooking or canning.

Brussels Sprouts.

Grown like cabbage.

Cabbage.

Set plants from indoor seed boxes or pots 15 inches apart in rows, the rows being 30 inches apart. Between these rows early lettuce, radishes, and other little crops may be planted. Early cabbage should be gathered as soon as it has formed solid heads. Late cabbage may be stored in trenches and covered with straw and earth.

Carrots.

Sow seed ½ inch deep, using ¼ ounce to 25 feet of row. Thin to 2 or 3 inches apart when roots crowd each other.

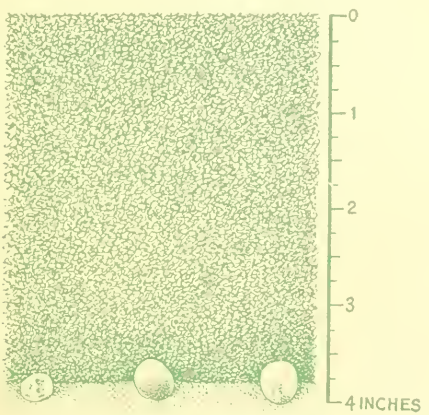


Fig. 16—Peas, planted properly, at a depth of 4 inches.

Cauliflower.

Grown the same as cabbages except when the heads form, the loose outer leaves should be tied together over the heads to keep out light and bleach the heads.

Celery.

Sow seed in seed boxes and set plants in garden in June or July, 6 inches apart, trenches 6 inches deep and 3 feet apart. As the plants grow, cultivate the ground into the trenches. When plants are large heap earth around stalks to whiten them.

Fig. 17—A tomato plant should be tied with a strip of cloth, at a height of ten inches from the ground, again at about 18 inches and again at about 26 inches. The plant here pictured is a good one from which to save seed.

Celeriac.

This is a large rooted form of celery It is grown like celery, except that the plants do not need blanching. The large root is cooked for use. The plants should be protected in freezing weather by straw or mulch (half rotted manure and straw), and dug as used

Corn, Sweet.

Plant 5 or 6 seed 1 inch deep in hills feet apart. When plants are 4 inches high pull out all but 2 or 3 plants in each hill. Make new plantings every 2 weeks until July or August so as to have corn for use during the entire season

Cucumbers.

Plant 8 to 10 seed 1 inch deep in hills 4 feet apart. Later thin to 2 plants per hill. Do not plant until soil is warm and frosts are over. Hoe or cultivate only until plants start to vine, then pull weeds by hand.

Eggplant.

Little plants from seed boxes are set 2 feet apart in rows 3 feet apart.

Endive.

In midsummer sow seed ½ inch deep and later thin plants to 8 inches apart. To blanch hearts raise leaves and tie together over heart.

Kale.

Sow seeds ½ inch deep in rows 18 to 24 inches apart. Thin the plants until they are from 6 to 8 inches apart in the rows.

Kohl-rabi.

Sow seed ½ inch deep and later thin plants to 4 or 6 inches apart.

Lettuce.

Sow seed ½ inch deep in rows 1 foot apart, and later thin out until plants are 5 to 6 inches apart. There should be successive plantings, but lettuce is not grown in extremely hot weather. Sow seed the last of August and in September to be transplanted to the cold frame in October.

Mint.

Roots may be procured from a seedsman or neighbor. Plant one or two clumps of these roots in a corner of garden in the spring.

Muskmelon.

Grown like cucumbers except hills must be 6 feet apart.

Muskmelons are difficult to raise and are not recommended to gardeners who are not experienced in their culture.

Onions.

Onions will grow from seed or from bulbs, called sets. It is better to use sets in home gardens. For early green onions plant sets 3 inches apart in rows 1 foot or more apart. To grow from seed, plant the seed rather thickly ¾ of an inch deep in rows and thin them later until plants are 2 to 3 inches apart. If sets for planting next spring are desired, do not thin out any plants, but let them crowd so they will remain small. Seed may be planted in seed box or seed bed and when transplanted placed 3 inches apart.

Parsley.

Sow seed thinly ½ inch deep, later thinning plants when they crowd each other.

Parsnips.

Sow seeds thinly ¾ of an inch deep in rows 18 to 24 inches apart and later thin plants to 3 inches apart.

Peas.

Peas should be planted in trenches 4 inches deep, the seed being covered with 3 to 4 inches of soil. From 1 to 2 pints of seed will plant 100 feet of row. As the plants grow, gradually fill in the trench around them. Let the vines grow up on brush or poultry wire. The rows of peas should be 3 to 4 feet apart, but if the space is small it is desirable to plant double rows 1 foot apart, placing the brush between these rows. Make three or four plantings in 2-week intervals to give a continuous crop.

Peppers.

Set young plants from seed box 18 inches apart in row.

Potatoes.

For special instructions on Irish and Sweet Potatoes see pages 13 and 14.

Pumpkin.

Plant in hills 8 to 10 feet apart, using 8 to 10 seed to a hill. Plant seed 1 inch deep. Later thin to 2 or 3 plants to a hill.

Radishes.

Planted and grown the same as carrots.

Rhubarb.

Procure roots from a neighbor or dealer, as seed planting is not advised. Set them 3 to 4 feet apart, in rows or next to fence. Use manure freely.

Salsify or Oyster Plant.

Also called vegetable oyster. Grown like carrots. Plants must be thinned to 3 inches apart.

Spinach.

Sow seed thickly 1 inch deep in rows 12 to 18 inches apart, for both early spring and fall crops.

Squash.

Grown the same as cucumbers or muskmelon, except that the hills of Hubbard squash should be 7 to 9 feet apart.

Swiss Chard.

Sow seed ½ inch deep. Thin out when necessary.

Tomato.

Set out young plants from seed boxes 30 to 36 inches apart and support them later with stakes driven into the ground. Rows should be 36 to 48 inches apart.

Turnip.

For early spring, plant ¼ ounce of seed to 50 feet of row, sowing them ½ inch deep, in rows 1 foot or more apart. For fall crop ¼ ounce of seed to 50 feet of row, ¼ inch deep.

Vegetable Marrow.

Plant 6 or 8 seed to a hill, one inch deep, in hills 8 to 9 feet apart. Thin to 2 plants to hill. Give the same care as for pumpkins. The young and tender vegetable marrow may be baked whole like sweet potatoes or may be sliced and fried like egg-plant, or boiled like summer squash.

Watermelon.

Plant 1 inch deep, 8 or 10 seed to each hill, the hills 10 feet apart. Later thin to 2 plants to each hill.

Watermelons are difficult to raise and are not recommended to gardeners who are not experienced in their culture.

DISEASE AND INSECT PREVENTION.

Every garden is subject to attack from insects and diseases. Your garden may not be attacked, but it is wise to take advance precautions. Spraying at occasional intervals from the time the plants have made their start until they are harvested is worth while. A hand sprayer should be used to distribute the necessary solutions on the plants. Such sprayers may be bought in various types. Some of them may be bought for a dollar or less and others range up to the neighborhood of $10 for the small, compressed air type. The simplest and cheapest type is the small atomizer sprayer with hand pump and with glass receptacle for holding mixture. (Figure 18). Another type, costing a little more, is the bucket pump. (Figure 18). If you have no spray pump a good substitute is the whisk broom, for spattering the spray on plants. The ordinary sprinkling pot may be used to apply the mixture, but this is wasteful.

Buy Spraying Materials Early.

Early purchase of spraying materials is important. The supply will be limited and the demand large. Make a list of the materials you will need, with amounts, and place your order immediately. If you delay until the spraying season arrives you are likely to fail to procure your supply. By joining with friends or neighbors and buying in quantities you can procure materials at lower prices than if buying alone.

For home mixing the poisons and chemicals required for sprays and other remedies and preventives can be bought at a drug or seed store. The mixtures ready prepared can be bought at a seed store.

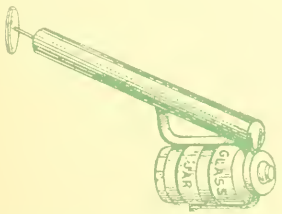
Diseases.

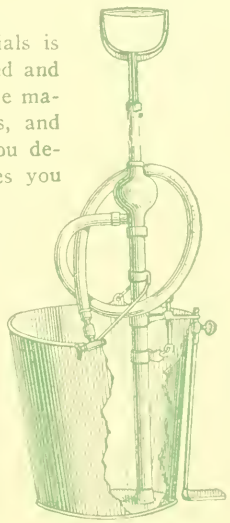
The ordinary blights are usually overcome by spraying with Bordeaux mixture, made as indicated in the next paragraph. There are some diseases, however, which cannot be overcome, and when trouble appears that does not yield to treatment the affected plants should be taken up and burned to prevent the spread of infection.

Bordeaux Mixture.

Copper Sulphate, Blue Stone or Blue Vitriol	3 ounces.
Lump Lime or Hydrated Lime	3 ounces
Water	2½ gallons

To make Bordeaux Mixture procure the ingredients at a drug or seed store. If lump lime is





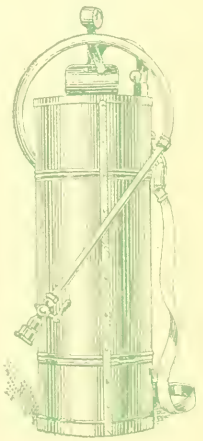


Fig 18—Some of the best types of sprayer. At the left is a hand sprayer, which is one of the most satisfactory for the small garden. The glass receptacle is better than metal. This sprayer can be bought for from 50 cents to $2.00. In the center is a bucket sprayer which costs about $5.00. At the right is a compressed air sprayer, which is highly efficient and costs from $5.00 to $10.00. One sprayer may be used by several families, or by community gardeners reducing the cost to each user

used it must be fresh. Instead of lump lime some authorities prefer fresh hydrated lime as being just as good and at the same time much simpler to use, needing only to be stirred into the water. Hydrated lime is lime to which enough water to dry-slake it has been added by the manufacturer. It is a powder and does not require slaking.

Fig. 19—Potato blights and their effect. At the left are shown leaves afflicted with early blight, indicated by brown spots with concentric rings. At the right is shown late blight, with dark brown spots looking watersoaked

For making or holding Bordeaux mixture use containers of wood or earthenware. In one container dissolve the copper sulphate in about one-half gallon of hot water and then dilute with enough cold water to make a total of 1¼ gallons. In another vessel slake the lime and dilute it with enough water to make 1¼ gallons. If hydrated lime is used simply mix it with water. Then pour these two solutions together, pouring the solution of copper sulphate slowly into the mixture of lime and water, stirring vigorously while this process is under way. The stirring issues proper mixing of the two.

Bordeaux mixture may be purchased in concentrated form from seedsmen, but the home made mixture is better and cheaper. Do not make more at one time than will be needed within a short time. The mixture is better and more effective if made fresh for each spraying.

Sulphur.

For the control of Mildew, pulverized sulphur or flowers of sulphur, procured at a drug or seed store, is dusted full strength on the diseased plants. A tin can with small holes punched in the bottom makes a good sifter for this purpose, or a cheap flour sifter may be used. The holes in a flour sifter are the proper size for this purpose.

THE SUCKING INSECTS.

For the destruction of insects which suck the sap of plants, such as the true bugs and the plant lice or aphids, it is necessary to use a mixture which kills by contact or substances which smother. Aphids or plant lice usually collect on the underside of leaves, causing them to crumple. This crumpling causes the edges of the leaves to turn down, protecting the aphids. Badly crumpled leaves should be picked and burned. In spraying be sure to apply the spray to the undersides of the leaves. Otherwise the edges will serve as protection and prevent the spray from reaching the entire plant effectively.

Nicotine Sulphate Solution.

To destroy the sucking insects use Nicotine Sulphate Solution, made as follows:

Nicotine sulphate	½ ounce.
Laundry or other soap	½ ounce.
Water	2 gallons

Dissolve the soap and then add this and the nicotine sulphate to the water.

Bordeaux and Nicotine Sulphate Combination.

A combination spray for plant diseases and sucking insects is made thus:

Bordeaux mixture	2 gallons
Nicotine sulphate	½ ounce
Laundry or other soap	½ ounce

THE EATING INSECTS.

The eating insects, or those which eat fruit or foliage, may usually be killed by using a spray of a poisonous solution or by dusting poison powders on the plants attacked. Arsenate of lead, procured at a drug or seed store, is a favorite poison for this purpose, and may be used in spray or powder, but it must be handled with care as it is poisonous to human beings. It should never be applied to vegetables that are soon to be used, nor on cabbage or cauliflower after the heads have begun to form. As an added precaution wash carefully all vegetables before using, whether they have been sprayed or not.

Arsenate of Lead Solution.

Arsenate of lead spraying solution is made by mixing 1 ounce of arsenate of lead powder with 6 quarts of water. If the arsenate of lead is used in paste form instead of powder mix 2 ounces with 6 quarts of water. The powder is more easily weighed and handled. Keep the mixture well stirred while spraying, to insure even distribution.

To apply arsenate of lead in dry form, mix 1 ounce of the powder with 3 pounds of air-slaked lime, dry road dust, or ashes finely sifted. Use a sifter for dusting this onto the plants, while the plants are wet with dew.

Bordeaux-Arsenate of Lead Combination.

Spraying with a combination of Bordeaux mixture and arsenate of lead every two weeks is a wise safeguard against both disease and eating insects. To make this combination spray use Bordeaux mixture instead of water when preparing the arsenate of lead. By using a combination spray half the labor of spraying is saved.

In spraying cabbage and cauliflower with Bordeaux and arsenate of lead before the heads form a little soap mixed with the arsenate of lead will make it stick better. Shave the soap, add a small quantity of water and boil until the soap is dissolved or put it in cold water and stir occasionally until dissolved. Cool and stir into the arsenate of lead solution.

Paris green has long been used for protection, but arsenate of lead is now used much more extensively and is considered better.

Pyrethrum.

The best spray for cabbage, cauliflower and similar vegetables, after the heads have begun to form, is Pyrethrum, which can be bought at a drug or seed store and which is not poisonous to human beings. It may be used as a spray in the proportion of 1 ounce of Pyrethrum to 2 gallons of water.

It will mix best if first made into a paste with warm water. It may also be used in its full strength as a powder, with bellows or sifter.

Poisoned Bait.

Poisoned bait is useful against cutworms and slugs. Small portions of the bait should be placed around plants subject to attack by them. The pests feed at night and hide under chips or other objects during the day.

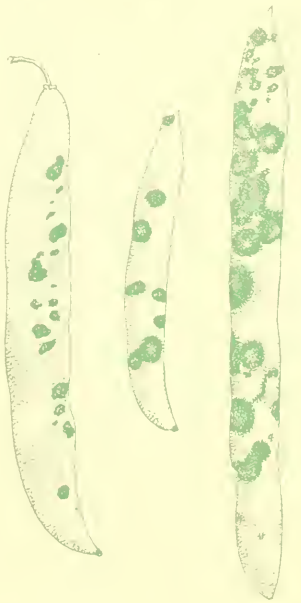


Fig. 2.—Bean anthracnose is indicated by dark, sunken, scale like spots on pods. There are also spots on leaves.

Bait should be placed beneath these. Poisoned bait may be made at home thus:

Wheat bran ..... 1 pound
White arsenic, powdered ..... ½ ounce
Cheap sirup ..... 1 or 2 ounces
One lemon or orange, chopped fine
Water to make a thick mash of the mixture.

The bran and the white arsenic should be mixed. Dilute the sirup with a little water

and pour this over the bran and white arsenic; add the lemon or orange and stir well. Add enough water to make a thick mash.

Removing Insects By Hand.

The larger eating insects may be removed by hand or knocked off into a pan of water on the surface of which a small quantity of kerosene is floating. Insects collected by hand should be destroyed immediately.

Some Other Forms of Protection.

One form of protection against cut worms is a collar 2 inches wide made of stiff paper, placed around the stem of the plant and with its lower edge inserted in the ground, to prevent the pests from reaching both stem and root.

Small frames covered with mosquito netting or cheesecloth set over young plants will protect them.

GUARD AGAINST DISEASES AND INSECTS.

An ounce of prevention is worth a pound of cure in the matter of controlling diseases and insects. Remnants of the year's crops should not be allowed to remain in the garden, as they will harbor and feed insects. All diseased plants which remain at the end of the season should be burned, as should all rubbish which is of such character that it will not decay and is therefore not useful in making compost. This includes trash, sticks and the like. It may seem like a waste of vegetable matter to burn the dead tomato vines, bean vines and other plant tops which have been diseased, but this should be done because to save or compost these for fertilizer would simply be maturing and saving millions of disease spores which would be on hand ready to attack the crops next year. More than this, a clean garden appeals to the eye and to the pride of the owner as a winter landscape.

Fig. 21—Emphasizing the importance of spraying. On the left is a potato plant which was not sprayed. The ravages of the potato bug are plainly shown. On the right is a plant which was properly sprayed as a preventive measure.

Corn stalks, cabbage leaves and stumps, beet tops if not canned, and other healthy plants, should be saved for mulching or be added to the compost heap.

The remnants of vegetable matter, which are not infected with disease or insects, should be made into compost heaps for the coming year and covered with stable manure and dirt to hasten decay, as decayed vegetable matter enriches the soil. (Directions for making a compost heap are given on page 6). Plowing or deep spading in the fall is important, as it breaks up the winter homes of underground insect pests.

PREVENTIVES AND REMEDIES.

NOTE: It is important that immediate attention be given insects and diseases as soon as they appear. Delay in spraying or removal may prove fatal.

ASPARAGUS.

Rust—(Rusty appearance of leaves and stems)—Procure rust resistant variety, such as Reading Giant or Palmetto.

Beetles—(Eat young stems and leaves).
Remedy: On young plants spray with arsenate of lead when pests appear, repeating 10 days later and again 10 days later if necessary. Do not use arsenate of lead on new stems used for food during cutting season. On old plants, spray after cutting season.

BEETS.

Leaf spot—(Reddish and purple spots, turning ashy gray)—Usually not affecting garden beets.
Remedy: Spray with Bordeaux mixture when plants are 3 to 4 inches high, repeating 2 and 4 weeks later.

Web worm—(Eats the leaves).
Remedy: Spray with arsenate of lead when worms appear; repeat when necessary.

Spinach aphis—(Sucks sap from leaves)—
Remedy: Spray with nicotine sulphate when pests appear and repeat when necessary. In order to strike the aphids the spray must be directed against the undersides of the leaves.

Beet-root aphis—(Sucks sap from roots).
Remedy: Pour a small amount of Nicotine sulphate spray around roots and repeat if necessary.

BUSH BEANS.

Anthracnose—(Dark, sunken spots, scab-like, on pods; spots on leaves)—Pick and burn diseased pods. In saving seed discard those from diseased plants, as seed carry the infection.

Leaf beetles—(Very small, dark or pale striped; eat leaves).

Remedy: Spray with arsenate of lead when pests appear, repeat in 10 days and later if necessary Bordeaux mixture repels but does not kill.

Aphids or plant lice—(Suck sap from plant and make leaves crumple).

Remedy: Spray with nicotine sulphate when pests appear, repeating when and as often as necessary Crumpled leaves protect lice from spray, and should be picked and burned. Apply spray to under side of leaves, to strike aphids.

Bacterial blight—(Water soaked spots on leaves and pods)—No satisfactory remedy. Pull up and burn plants

CABBAGE AND CAULIFLOWER.

Club root—(Root swells and decays).—Pull up and burn plants

Preventive: In spring apply 1 lb. lime to each 8 sq. ft of ground before setting out plants

Black rot—(Leaves turn yellow, then brown and black, and decay. Pull up and burn plants.)

Preventive: Soak seed 15 minutes in solution made of ¼ oz. formalin and 3 pints water; rinse in clean water, plant at once

Yellows—(Leaves turn yellow, then brown, and drop). Pull up and burn plants.

Preventive: Treat seed as for black rot.

Cabbage worms—(Eat leaves).

Remedy: When worms appear spray with arsenate of lead, repeating if necessary before heads form. **Do not use arsenate of lead after heads form.** Pyrethrum may be used instead of arsenate of lead and with it spraying may be done after heads form.

Aphids or lice—(Suck sap from leaves)—

Remedy: Spray with nicotine sulphate solution when pests appear; repeat if necessary

Cabbage looper—(Eats leaves).

Remedy: Treat as for cabbage worms.

Cabbage Maggots—(Tunnel inside of roots)

Preventive: When plants are set out take a piece of tarred building paper 2 or 3 inches in diameter, cut a slit from one side to center, and 4 or 5 slits at center Fit this around stem by slipping plant through the long slit, and press paper firmly against ground, to prevent young maggots from reaching root

Black leg—(Diseased, sunken areas on stem, leaf stem and leaves, plant becoming purplish)—There is no remedy. Pull up and burn plants

Preventive: As soon as seed are planted in seed bed sprinkle 2 quarts Bordeaux mixture on each 5 sq ft. Repeat in 2 weeks and again just before plants are taken out of seed bed

Cutworms—(Dark colored, eat young plants off at surface of earth).

Remedy: Spread poisoned bran mash over ground before setting out plants; spread around plants when set. Afterwards spread poisoned bait around plants as necessary to control worms. It is wise to wrap paper around stem from leaves to root just before setting out. Cutworms are especially abundant where sod has grown.

CELERY AND CELERIAC.

Blight or leaf spot—(Gray or brown spots, drooping stems).

Remedy: Spray young seedlings, in seed box or seed bed, with Bordeaux mixture. Spray again as soon as set in garden, repeating 10 to 14 days later. Repeat again if necessary. Spraying in seed bed must not be neglected if disease appears.

Damping off—(Small seedlings dying in seed bed)

Preventive: Care should be taken to water and partially shade the young seedlings in hot and dry weather. As soon as seeds are planted cover bed with thin layer of sand.

SWISS CHARD.

Leaf spot—(Symptoms same as with beets).

Remedy: When disease appears, spray as directed for beets. (Usually no spraying will be found necessary). Wash sprayed leaves well before using.

SPINACH.

Aphids—(Suck sap from leaves).

Remedy: Spray under side of leaves with nicotine sulphate when aphids appear. Repeat a second and third time if necessary

CORN.

Smut—(Large, black, irregular swellings on ears or tops). The only remedy is to cut off and burn the smut swellings.

Corn ear worms—(Bore through husk and eats the young kernels). Kill all worms which are found when husking corn for use.

Cutworms—(A dark worm which cuts plant off at surface of earth when plant is small).

Remedy: Use poisoned bait in the same manner prescribed for cabbage. Repeat if necessary. Being a night worker the cut-worm is usually found in the morning in the ground by cut off plants. Dig out and kill.

CUCUMBERS.

Anthracnose—(Brown spots on leaves).

Remedy: Spray with Bordeaux mixture when plants begin to form vines. Repeat two or three times if necessary, at intervals of 2 weeks.

Downy mildew—(Yellow spots on leaves).

Remedy: Treat as for anthracnose.

Wilt—(Leaves droop and wilt quickly).—Pull up and burn plants. Striped beetles act as carriers of this disease and should be controlled carefully

Stink bug or squash bug—(Sucks sap from leaves and injects an injurious substance).

Remedy: Pick them or shake them into pan of water and kerosene. Destroy egg masses. Place small pieces of boards near hills. The bugs will collect underneath these and may be easily crushed.

Striped beetle or 12-spotted beetle—(Both eat leaves).

Preventive: Cover plants with protectors of cloth or wire gauze.

Control: Mix arsenate of lead in the Bordeaux mixture which is used for diseases Another remedy is to cover leaves with tobacco dust. Treatment should be given as soon as beetles appear, or when covers are removed. Repeat 5 days later and again 5 days later, with further repetitions when necessary.

Vine borer—(Worm which bores into vine at surface of earth).

Remedy: Carefully cut the vine lengthwise, remove borer and kill. As plants grow throw earth over vine at every other joint, in order that new roots may form.

EGGPLANT.

Blight or wilt.—(Whole plant wilts)—No remedy. Pull up and burn plants

Flea beetle—(Small jumping beetle which eats leaves).

Remedy: Spray with Bordeaux mixture and arsenate of lead combination.

Anthracnose—(Dark sunken spots in fruit; cracks in leaves).

Remedy: Spray with Bordeaux mixture when plants are set, repeating 10 days later and again 10 days later.

ONIONS.

Thrips—(Very small sucking insects, which cause leaves to turn a silvery color or whitish, and later to curl and twist)

Remedy: Spray with nicotine sulphate solution when pests appear, repeating once or twice as necessary.

Cut Worms—(Dark worms which attack onions as they do corn).

Remedy: Same as with corn.

PEAS.

Powdery mildew—(Covers plant with powdery white growth).

Remedy: Use pulverized sulphur or flowers of sulphur, or Bordeaux mixture, by sprinkling on plants when mildew appears, just before bloom appears. Repeat if necessary two weeks later and again 2 weeks later.

Pea aphis.

Remedy: Same as for bean aphids.

POTATOES.

Early blight—(Brown spots, with concentric rings on leaves. Worst in moist weather).

Remedy: Spray with Bordeaux mixture when plants are 6 inches high. Repeat two weeks later and again two weeks later.

Late blight—(Dark brown spots on leaves, appearing water soaked and not having concentric rings. The spots become yellow and the leaves die. Worst in hot, sultry weather, August and September. Lives over winter in seed potatoes).

Remedy: Same as for early blight.

Colorado potato beetle—(The common Potato bug, which eats leaves).

Remedy: Spray with arsenate of lead when beetles appear. Repeat when and as often as is necessary. Hand picking is effective, as is also knocking the bugs into a pan of water containing some kerosene.

Blister beetle—Long black potato bug or Old Fashioned potato bug. (Eats leaves).

Remedy: Same as for Colorado potato beetle.

Flea beetle—(Small, jumping insect which eats leaves, usually appearing when plant is small).

Remedy: Spray as for Colorado potato beetle.

PUMPKIN.

This plant is subject to the same diseases and insects as cucumber, and should be treated the same way.

RADISH.

Cabbage maggot—(Small worm which tunnels into the radish).

Preventive: Sprinkle tobacco dust along row when seed is planted, or spread sand on which kerosene has been sprinkled along the row when plants are small. Burn all plants that may be infested.

TURNIP.

Subject to the same diseases and insects as cabbage, and should be treated the same way.

RUTABAGA.

This plant is subject to the same pests as cabbage and should be treated the same way.

RHUBARB.

Flea beetle—(Eats small holes in the leaves).

Remedy: Same as for flea beetle of potato, applied when beetles first appear and repeated when necessary.

SQUASH.

This plant is subject to the same diseases and insects as cucumbers and should be treated the same way.

TOMATOES.

Leaf spot, or blight.—(Leaves become spotted, turn yellow and drop; stems dry up and fruits drop).

Remedy: Spraying is not entirely effective but is helpful. Spray with Bordeaux mixture while plants are small in seed box or seed bed. Repeat soon after transplanting to garden and repeat again 3 weeks later and every 3 weeks while disease exists.

Fruit rot—(Decay begins at blossom end of fruit).

Preventive: In the absence of an effective remedy the only safeguard is to cultivate well and be careful to water as the plants need.

Anthracnose—(Sunken, discolored spots in fruit, followed by decay).

Remedy: Same as for leaf spot.

Wilt—(Causes plant to wilt and die)—Pull up and burn plants.

Tomato worms—(Large green naked caterpillar, which eats leaves).

Remedy: Pick by hand and destroy. (These worms do not often appear in large numbers).

Cutworms—(Dark worms which cut plants off at the surface of earth).

Remedy: Same as with cabbage.

Flea beetle- (Small jumping beetle which eats small holes in leaves).

Remedy: Same as with potatoes.

WATERMELON.

Anthracnose—(Brown spots on leaves; small sunken spots on fruit).

Remedy: Spray with Bordeaux mixture when melons are half grown. Repeat 10 days later and again if necessary.

Insects—This plant is subject to the same insects as cucumber and should be treated the same way.

The seed shortage this year makes it important for Home Gardeners to save seed from this year's crop for next year's garden. Instructions for saving and storing seed are given on Page 31.

PLANTING TABLE

Vegetable	Quantity required for 100 feet of row	Distance Apart In Inches		Depth of Planting Inches	Time of Planting	Mature (In days, except as noted
		Rows	In Row			
Asparagus, seed	1 oz.	12 to 24	3 to 5	½ to 1	Early spring	3 to 4 yrs.
Asparagus, plants	60 to 80	36 to 18	15 to 20	8 to 10	Early spring	1 to 3 yrs.
Beans, snap	½ to 1 qt.	20 to 24	4 to 6	1	April to August	40 to 65
Beans, pole	½ pt.	36 to 48	Hills 24-36	1	May and June	50 to 80
Beans Lima, bush	½ to 1 pt.	18 to 24	4 to 6	1	May and June	60 to 90
Beans Lima, pole	½ pt.	36 to 48	Hills 24 to 36	1	April to August	75 to 80
Beets	2 oz.	12 to 18	5 or 6 to ft.	1 to 2	April to July	60 to 80
Brussels sprouts	¼ oz.	24 to 3	16 to 24	½	April to August	60 to 80
Cabbage, early	¼ oz.	24 to 30	12 to 18	½	March and April (Start in hotbed during February)	90 to 150
Cabbage, late	¼ oz.	24 to 30	16 to 24	½	May and June	90 to 130
Carrot	1 oz.	18 to 24	6 or 7 to ft.	½	April to June	75 to 110
Cauliflower	1 packet	24 to 30	14 to 18	½	April to June (Start in hotbed during February or March)	100 to 130
Celery	¼ oz.	18 to 30	4 to 8	½	May and June (Start in hotbed during March or April)	120 to 150
Chard	½ oz.	18 to 24	4 to 6 or 1 ft.	½	April to July	60 to 80
Corn, sweet	1 pt.	30 to 36	30 to 36	1 to 2	May to July	60 to 100
Cress, upland	½ oz.	12 to 18	4 or 5 to ft.	½	March to May	30 to 40
Cucumber	½ oz.	48 to 72	48 to 72	1	April to July	60 to 80
Eggplant	1-3 oz.	24 to 36	18 to 24	½ to 1	April and May (Start in hotbed during March)	100 to 140
Endive	1 oz.	18	8 to 10	½	Midsummer	90 to 180
Horse radish	70 roots	24 to 30	1 to 6	3 to 4	Early spring	1 to 2 yrs
Kale	½ oz.	18 to 24	6 to 8	½	August and September	90 to 120
Kohl rabi	¼ oz.	18 to 24	4 to 6	½	April to August	60 to 80
Lettuce	½ oz.	12 to 18	4 to 6	½	March to September	60 to 90
Muskmelon	½ oz.	72 to 96	Hills 72	1	April to June (Start early plants in hotbed during March)	120 to 150
Okra, or gumbo	2 oz.	36 to 48	24 to 30	1 to 2	May and June	60 to 90
Onion, seed	1 oz.	12 to 18	3 or 10 to 15	½ to 1	April and May	130 to 150
Onion, sets	1 qt.	12 to 18	4 or 5 to ft.	1 to 2	Autumn and March to May	90 to 120
Parsley	¼ oz.	12 to 18	3 to 6	⅛	Early spring and September	90 to 120
Parsnip	½ oz.	18 to 24	4 or 6 to ft.	½ to 1	April and May	125 to 160
Peas	1 to 2 pt.	36 to 48	15 to 1	3 to 4	March to June	10 to 80
Pepper	⅛ oz.	18 to 24	15 to 18	½	May and June (Start early plants in hotbed during March)	100 to 140
Potato, Irish	5 lbs.	24 to 36	14 to 18	3 to 5	March to June	80 to 140
Potato, sweet	75 slips	36 to 60	14	2 to 3	March to June	100 to 130
Pumpkin	½ oz.	96 to 144	96 to 144	1	May	100 to 140
Radish	1 oz.	12 to 18	8 or 12 to 15	½	March to September	20 to 40
Rhubarb, plants	33	36 to 60	36 to 48	*NOTE	Early spring	1 to 3 yrs
Rutabaga	¼ oz.	18 to 24	6 to 8	½ to 1	May and June	60 to 80
Salsify	½ oz.	18 to 24	2 to 3	½	Early spring	120 to 180
Spinach	1 oz.	12 to 18	7 or 8 to ft.	1 to 2	September or very early spring	30 to 60
Squash, bush	½ oz.	36 to 48	Hills 36-48	1	April to June	60 to 80
Squash, late	½ oz.	84 to 120	Hills 84-108	1	April to June	120 to 160
Tomato, seed	½ oz.	36 to 48	30 to 36	½ to 1	May and June (Start early plants in hotbed during February and March)	100 to 140
Tomato, plants	33 to 40	36 to 48	30 to 36			80 to 100
Turnip	½ oz.	18 to 24	6 or 7 to ft.	¼ to ½	April and August	60 to 80
Veg. marrow	1 oz.	96 to 144	Hills 96-108	1 to 2	April to June	110 to 140
Watermelon	1 oz.	96 to 120	96 to 120	1	May	100 to 120

*NOTE—Set Rhubarb plants so that growing tips are at surface of ground

Absolute dates for planting can not be given, because of variations in seasons from year to year and varying climatic conditions in different sections. For general guidance see "When to Plant," on Page 11.

PART II.

HOME STORAGE MANUAL FOR VEGETABLES AND APPLES

As a wartime measure no form of Food Conservation is more important than the home storage of vegetables for winter use. Canning and drying are essential to the nation's food supply, and should be practiced to the fullest possible extent, but they do not take the place of storage. To keep vegetables in their natural state is the simplest form of preparation for winter needs. By taking proper precautions against decay and freezing an abundant supply of certain kinds of fresh vegetables may be kept at minimum expenditure of money and effort.

STORAGE NEEDED AS A WAR MEASURE.

The importance of making provision for winter food needs is even greater this year than it was in 1917. Every pound of foodstuffs that can be spared for export will be needed in Europe for feeding American troops and to prevent the starvation of the domestic and military populations of the Allied Nations. Every pound of vegetables stored away for home uses will release exportable food. A nation at war is a nation with a food problem. A nation with a food shortage is a nation in peril. For this reason it is of vital importance that no vegetables of high food value be allowed to go to waste.

The home gardening campaign conducted by the National War Garden Commission will this year result in the creation of a vast new planting area. The output of these gardens is greatly in excess of immediate needs. Unless proper steps are taken to safeguard the surplus the waste will be prodigious. This Commission will stimulate nation-wide activity in canning and drying. An important purpose of this booklet is to arouse similar interest in the storage of vegetables.

WHAT AND HOW TO STORE.

There are many vegetables which can be stored to good advantage. Included in the list are Potatoes, Beets, Carrots, Parsnips, Onions, Sweet Potatoes, Celery, Salsify, Cabbage, Cauliflower, Brussels Sprouts, Winter Squash, Turnips, Beans and Lima Beans. Good results in storage depend upon:

1—Ventilation.
2—Regulation of temperature.
3—Sufficient moisture.
4—Quality of vegetables stored.

For some vegetables satisfactory storage places are afforded by the pantry shelf or attic. For others the cellar is the right place. For others outdoor storage is preferable. This may take the form of pits or banks, or it may be done in hillside caves or cellars.

COMMUNITY STORAGE.

Especially good results may be obtained if several neighboring families will form community clubs to provide storage facilities. In this way very complete provision may be made for handling winter supplies at slight trouble and expense to the individual household.

Community or co-operative storage may be effected in various ways. Several families may join together and construct outdoor cellars or they may join in the use of an available building conveniently located, in which vegetables may be stored in large quantities.

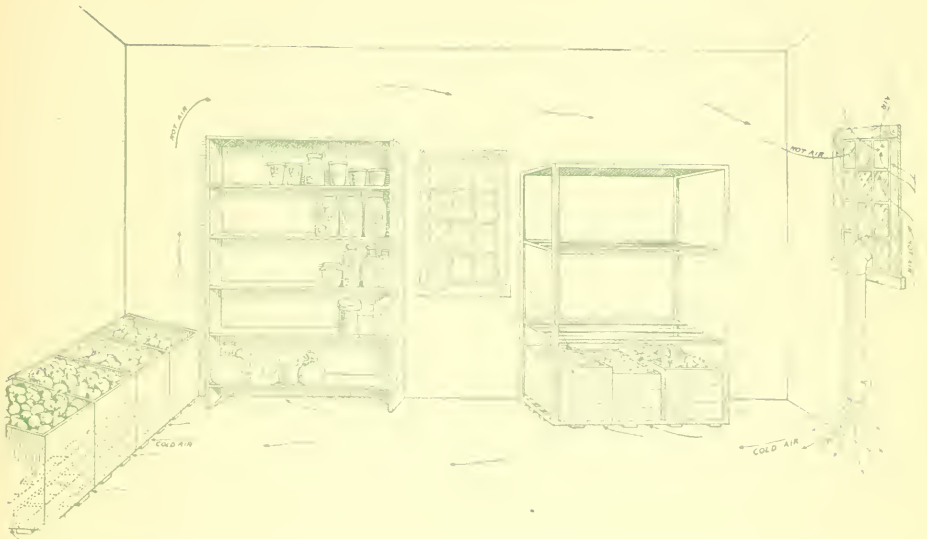


Fig. 1—This suggests an arrangement for storage in a cool cellar. An earth floor is best, as it gives off some moisture. If the floor is of concrete it should be covered with 2 or 3 inches of sand and this should be sprinkled with water occasionally. In the drawing the pane in the upper right hand corner of the window is shown to be missing. This is to allow the escape of heated air In severely cold weather close this opening. The stove pipe fitted into the place for one of the lower panes admits cold air. Instead of a stove pipe a wooden flue, made of old boards or parts of boxes may be used. Bins and boxes should be placed on slats to lift them from the floor and allow circulation. For this same purpose bins and boxes should be at least one or two inches from the wall. Air holes bored in sides and bottom of bins and boxes help circulation. Protect glass jars from light.

CELLAR STORAGE.

Beets	**Parsnips**
Cabbage	**Potatoes**
Carrots	**Salsify**
Celery	**Turnips**

In a house heated by a cellar furnace vegetables may be stored to good advantage in the cellar. Partition off a small room as far as possible from the heating plant. Two sides of this room should be outside walls. There should be at least one outside window, for temperature regulation and ventilation. The suggested arrangement in Figure 1 shows ventilation afforded by a stove-pipe inserted through one of the lower panes of the window, to admit cold air and indicates the removal of one of the upper panes of glass to allow the escape of warm air. This affords constant circulation.

An earth floor is desirable, but this is not always possible, as most city and many town and country houses have floors of concrete. In a cellar with a concrete floor the concrete should be covered with two or three inches of sand, which should be sprinkled with water from time to time.

In this room may be stored Beets, Carrots, Cabbage, Celery, Parsnips, Salsify, Turnips and Potatoes. (Special attention is given Potatoes on Page 29). Put them in bins or in boxes, baskets, slat crates or barrels. It is best to use movable containers and small ones. Bins should not hold more than two or three bushels apiece, as the larger bulk brings danger of heating and consequent decay. There should be full protection from mice.

The vegetables should be harvested when the ground is dry, if possible, and should lie outdoors a few hours until any surface moisture on them has evaporated. Remove the tops, leaving an inch or so, from beets, turnips, carrots and salsify. To leave an inch or so of top prevents bleeding and drying out. Sort vegetables according to size and condition. Imperfect or bruised ones should be selected for immediate use and only sound vegetables should be stored.

In cellar storage beets, turnips and carrots may be buried in slightly damp sand to good purpose.

Cabbages may be stored in the cellar in boxes or barrels of earth or sand, or they may be placed in a cool cellar on the floor, with roots up.

Celery, to be stored in a cellar, should be allowed to stay in the garden until there is danger of severe freezing. In order to prolong the period of keeping it outdoors the plants should be protected from frost by banking them with earth to within two or three inches of the tops. On cold nights protect the tops with blankets, mats, straw or other covering. The importance of not harvesting at the first appearance of frost arises from the fact that this period is likely to be followed by warm weather, which will cause decay by creating too high a temperature in the place of storage. With the arrival of steady cool weather which will freeze the plants, dig them, leaving some soil adhering to the roots. For cellar storage place the plants upright, covering the roots with three or four inches of sand or light soil. (Fig. 2). Earth may be banked around the stalks but this is not necessary. Water the soil occasionally, being sure to keep the leaves and stalks dry to prevent decay.

Fig. 2—For storage in cellar without heater celery should be set in two or three inches of sand or light soil and the plants then banked with soil. The soil must not be allowed to become dry.

Celery may also be stored in cellar boxes, following these same directions.

The cellar storage room may also be used for the storage of fresh fruits and for canned goods, preserves and dried vegetables and fruits. Fig. 1 shows a suggested arrangement for shelves for canned and dried articles. If the shelves are not protected from light by doors all canned goods in glass should be wrapped in brown paper, to prevent bleaching of the contents as a result of exposure to the light.

Wide fluctuations of temperature should be avoided. The ideal temperature is 40 degrees F. The root cellar should be kept at not less than 32 degrees and not over 50 degrees.

PIT STORAGE.

Beets	Potatoes
Carrots	Turnips
Cabbage	Salsify
Celery	Parsnips

For outdoor storage one of the best forms is a mound shaped pit. To prepare for this remove two or three inches of earth and line this shallow excavation with hay, straw, leaves or similar material. Place the vegetables on this in a conical pile. Cover the vegetables with several inches of the material used in making the lining. Cover this with 3 or 4 inches of earth. As severe weather approaches the outer covering should be increased. An additional layer of hay or similar material may be placed over the layer of earth and on top of this another layer of earth. In extremely cold climates the total thickness of earth layers should be as much as 12 inches. Over the outer layer of earth pile manure or corn stalks for added protection. To give ventilation have the inner layer of straw project through the outer covering and extend to the top of the cone. For protection from

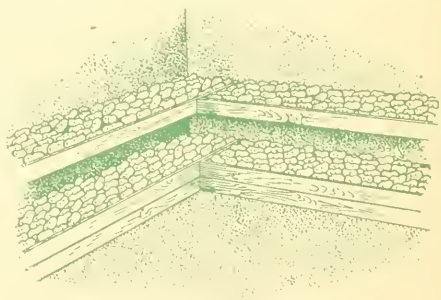


Fig. 3—Shallow bins or shelves with board sides, for storing root crops in cool cellar. The air of the room must not be allowed to become too dry, as this will cause the vegetables to shrivel. Potatoes must be protected from light.

rain and snow this opening should be covered. A board laid over the top and weighted with a stone is suitable for this purpose. An idea of the construction is given in Fig. 4.

It is well to make several small pits rather than one large one, for the reason that when a pit has been once opened the entire contents should be removed. This form of storage is used for potatoes, beets, carrots, turnips, parsnips, cabbage and salsify. It is well to store several varieties of vegetables in one pit so that the opening of a single pit will afford a supply of all of them. In following this plan it is desirable to separate the various crops by the use of straw or leaves.

When a pit has been opened it is impossible to give adequate protection to vegetables therein. For this reason those not required for immediate use should be removed, placed in the basement storage room, or other cool place, and used as needed. This emphasizes the importance of making small pits, each one holding not more than two to six weeks' supply.

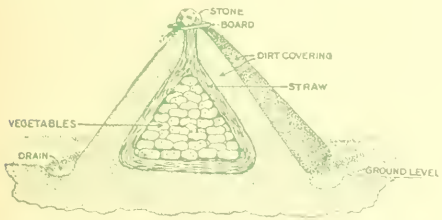


Fig. 4—Irish potatoes in an outdoor mound. This mound must be in a well drained location. After removing 2 or 3 inches of earth, pile the potatoes on a 2 or 3 inch layer of dry straw, leaves or hay. Cover the vegetables with 2 or 3 inches of straw, leaves or hay, and cover this with 3 or 4 inches of earth. Increase the thickness of the earth layer as severe weather approaches, making it as much as 12 inches in extremely cold climates. Manure or corn stalks should be piled over the mound. The straw, coming to the top, will afford ventilation. The opening should be covered for protection from rain.

For late varieties of cabbage the pit should be long and narrow. The cabbages are placed in rows with heads down and covered with dirt. No other covering is needed. The removal of a portion of this supply does not disturb the remainder. (Fig. 5).

Cabbages may also be stored by placing the whole plants in a trench, roots down, and plants close together. The roots should be covered with dirt. A frame should be built around the trench by driving stakes at the corners and placing boards against these to form the enclosure. The construction of such a trench is shown in Fig. 6. The boards are banked with earth and across the top of the trench

Fig. 5—Cabbage stored, roots up, in a bank of earth. The place must be well drained. The cabbages are covered with earth but this need not be as thick as for some vegetables, as slight freezing does not hurt cabbage.

boards or poles are placed, supported by the frame. These should be covered with straw, hay or corn fodder, for protection of the contents of the trench. Two feet of the straw or similar material will be required in cold climates.

Mature heads of cabbage of long-keeping sorts, such as Danish Ball Head, may be cut from the plant and stored one layer deep on shelves in cool, frost-proof cellars.

In storing celery in a pit or trench, the plants are set side by side as close as they may be packed and wide boards set up along the outside edges of the pit. Dirt is banked up against these boards and the top covered with corn fodder or similar

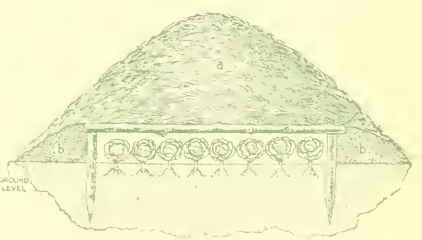


Fig. 6—This shows cabbage, pulled with roots, stored by being set in a shallow trench, with roots down. The roots are covered with earth. The stakes, projecting 2 feet above the surface of the earth serve as supports for boards or poles which make an enclosure. This frame should be banked with dirt (b). Across the top place poles or plank and cover with straw, hay or corn fodder (a). Make the trench as long as necessary and any width up to 8 feet.

covering. If celery is kept in the row where grown the earth should be banked around the plants with the approach of cold weather. For freezing weather

bring the dirt to the tops of the plants and cover the ridge with coarse manure, straw or fodder, using stakes or boards to hold the covering in place. Only late maturing and late planted celery can be safely stored. (Fig. 7).

Fig. 7—This shows celery set into an outdoor pit or trench for storage. Boards should be placed along the edges of the pit or trench and dirt banked against these boards. The tops of the celery should be covered with corn fodder, straw or similar covering. The celery may be removed easily at any time.

A hotbed, instructions for the making of which are given on Page 6 (Fig. 2), in Part I. of this booklet, makes an excellent place for outdoor storage for celery. The surplus earth and manure should be removed and a board covering should be substituted for the sash and glass. Store the celery in the same manner as in pit torage. For protection from cold use any covering that will prevent freezing.

Celery should not be stored with turnips or cabbage. It will absorb odors from these vegetables and its flavor will be impaired.

OUTDOOR CELLAR.

Beets	**Potatoes**
Carrots	**Turnips**
Parsnips	**Salsify**

Cabbage.

An outdoor cellar makes a good storage place. In cold climates this should be partially underground. A side-hill location is desirable for ease in handling the vegetables. To make such a cellar dig an excavation and in this erect a frame by setting posts in rows near the dirt walls. Saw these posts off at uniform height and place plates on their tops. On these plates place rafters. Board up completely with the exception of a place for the door. The whole should be covered with dirt and sod, and in cold climates added protection should be given by a layer of straw, fodder or similar material. Ventilate with a flue. A dirt floor is best, as some moisture is desirable. This form of storage is especially good for the joint use of several families.

On a more pretentious scale cellars of this nature may be made of brick, stone or concrete. Such cellars afford practically perfect storage room for potatoes, carrots, cabbages, parsnips, beets, turnips and salsify

VARIOUS METHODS.

Permanent cold frames, with deep pits, may also be used to advantage in storing vegetables if the drainage is made thorough. After the frames are filled the sash should be covered with boards and the outside banked with soil or manure. As the weather becomes severe a covering of straw or mats is necessary. This covering should be heavy enough to prevent freezing.

Cauliflower and Brussels sprouts which have not matured may be taken up and planted in shallow boxes of soil in a light place in the cellar. If kept well watered they will mature for winter use.

Dry beans may be stored in cloth bags in a pantry or in any cool, dry and well ventilated room. The bags should be hung away from the floor to prevent damage by rats and mice.

Onions require a cool, dry place. They should be cured by being exposed to the air for a few days in the shade. The tops should be removed before storing. Keep them in baskets, trays or other holders which let the air circulate. Onions are not damaged by temperatures slightly below freezing, and for storing them the attic is better than the cellar.

Squashes are susceptible to cold and moisture, and for that reason should be stored in a dry place where the temperature will be between 50 and 60 degrees F. Squashes may be kept by placing them in a single layer on a dry floor and covering

with rugs or carpets, but care must be taken that the stems are not broken off and that they do not become bruised before storing. Whenever it is found that any of the squashes or pumpkins are showing signs of decay, the sound portions should be canned.

Tomatoes may be saved by pulling up the entire plant before freezing weather. The vines should be suspended by the roots in a cool cellar. The tomatoes will gradually ripen. If these tomatoes, when cooked, are found to be acid, the acidity can be overcome by using baking soda.

Parsley may be saved by transplanting into flower pots late in the fall. These should be kept in windows where they will receive sunshine.

Parsnips and salsify are not injured by remaining in the ground all winter. Enough for immediate needs may be dug in the fall and the others harvested as required.

POTATOES.

As one of the staple vegetables, potatoes are entitled to special consideration for winter storage. If you have raised a surplus crop in your own garden save as many as possible for your winter's supply. If you have none of your own raising it is well to buy them early in the fall, at the time of greatest supply and lowest prices, and store them for the winter, making yourself independent of the market during the time of highest prices.

Potatoes may be stored in cellars, pits and outdoor cellars, as already described. Before they are stored they should be allowed to dry. This is done by digging them on bright days, if possible, and allowing them to lie alongside the rows for a few hours. Before storing sort them carefully as to size and soundness. The smaller potatoes and those which show signs of threatened decay should not be stored, but should be used early.

The success of potato storage depends on the exclusion of light, proper ventilation, the proper amount of moisture, the size of the pile or container and the type of the tubers stored.

In storing potatoes it should be remembered that the purpose is to protect them from great changes of temperature and from light. Even a small amount of light changes the food value of potatoes. There should be enough moisture to keep the potatoes from wilting, but not enough to cause moisture to gather on the surface.

If potatoes are stored in a place where there is moisture in the air, provision should be made to permit free circulation of air through the containers. Barrels, boxes and bins may be ventilated by boring holes in sides and bottoms. Barrels, boxes and crates should be set on slats to hold them off the floor and allow the air to circulate underneath.

If the air of the storage place is dry it should not be allowed to circulate freely through the containers, as dry air will cause withering of the potatoes. In such storage places the potatoes should be put in containers made airtight by lining bottom and sides with several thicknesses of newspaper and covering the top snugly in the same manner.

The temperature of a cellar storage room for potatoes should be carefully controlled to prevent wide fluctuations. A constant temperature around 40 degrees F. is desirable It should not be allowed to go below 32 degrees or above 50 degrees.

Potatoes should not be washed before storage. If they begin sprouting in the spring all the shoots should be rubbed off. The bins should be examined occasionally and any rotting potatoes removed to prevent the spread of infection.

Bins.

Do not have one large bin for potatoes, as those in the center will be subjected to too high temperature, which will cause all of them to go through a sweating process. Too large a bin makes good ventilation impossible. Open bins, not more than a foot deep, arranged as a shelf, as shown in Fig. 3, are the best for cellar storage.

Pits.

A small pit provided with ventilation, as shown in Fig. 4, is the most satisfactory. It is better to have several small pits than one large one, as the entire contents must be removed when a pit is opened. Place not more than two to six weeks' supply in a single pit.

SWEET POTATOES.

In storing sweet potatoes the important points to be kept in mind are that the potatoes must be well matured before they are dug; they must be handled with extreme care; they must be allowed to dry or cure thoroughly before storage, and they must be kept at an even temperature. A test for maturity is to cut or break a sweet potato and expose it to the air for a few minutes. If the surface of the cut or break dries the potato may be considered mature, but if moisture remains on the surface it is not properly ripe. In sections where frosts come early digging should take place about the time the first frost is expected, without regard to maturity. Care in handling is necessary to prevent bruising and subsequent decay. Curing is done by keeping them at an even temperature of 80 to 85 degrees F. for a week or ten days after harvesting, to dry off the moisture. The room in which this is done must be ventilated in order that the moisture-laden air may escape.

For storing sweet potatoes on a large scale a specially constructed house is desirable. For home storage the roots may be kept near the furnace in the cellar or near the furnace chimney in a vacant upstairs room or in the attic. The room should be kept fairly warm. After curing the temperature should be maintained around 55 degrees F.

APPLES.

Apple storage is simple and is desirable not only for those who grow their own apples but also for those who depend on the market for their supply. The one essential is that the fruit be kept in a cool, dry place, and so stored as to be in no danger of absorbing odors from vegetables stored nearby.

Families raising no apples, but having a good storage place, meeting the requirements as to temperature, will find it advantageous to buy a winter's supply in the fall, when prices are low. The cost of purchases thus made will be considerably less than if apples are bought as needed during the winter.

To store, sort apples carefully, removing and using at once all fruit which is bruised or shows signs of decay. The best results are secured by wrapping each apple in half a sheet of newspaper and storing in barrels, boxes, crates or bins. The wrapping prevents the apples from touching each other and thus prevents the spread of decay which may start. It also protects the apples from odors if vegetables are stored nearby. Apples absorb odors freely from potatoes, onions, turnips and other vegetables and should never be stored, unwrapped, in the same room with vegetables of any kind. In addition to wrapping the individual apples it is desirable to line the barrel or other container with a half inch thickness of newspapers, on the bottom and sides, and then cover the top with newspapers and either nail a cover on or tie the papers securely with strings. This will keep odors out. The lining and covering give full protection and make it possible to store apples in the general cellar storage room.

Remember that the cellar or other place in which they are stored must be cool. A temperature of 32 degrees F. is ideal, and the temperature should not be allowed to go above 40 degrees if it can be held this low.

Apples may be stored unwrapped in barrels, boxes, crates or bins if proper attention is paid to sorting, to providing a cool place for storage and to occasional sorting during the winter, for the removal of possible decayed fruit. If any of the fruit in any container is found to have begun to decay all the apples in all the containers should be sorted at once and decaying fruit removed. Apples stored unwrapped must not be kept in the room with vegetables.

This manual was prepared by the Commission's experts and is based on their own research and experience, supplemented by information procured from the United States Department of Agriculture, from Agricultural Colleges and Experiment Stations and from other sources.

SAVE NEXT YEAR'S SEED FROM THIS YEAR'S GARDEN.

Owners of gardens will find it a great help next spring if seed have been saved from this year's garden. Ordinarily it is more satisfactory to purchase seed from reliable seedsmen. The increased planting of home gardens, the poor crops of seed, and the use of seed for food have caused a shortage of seed and, as an emergency measure, each gardener should save as much seed as possible. Saving of seed is easily done, though it requires care and attention. There are many vegetables from which seed may be saved In saving seed select them from plants of a single variety grown by itself if possible rather than from plants where more than one variety have been planted. When there are two or more varieties of the same vegetable growing side by side, cross fertilization frequently takes place and standard seed can not always be obtained. Select plants which are free from disease and which bear high production of crop. Mark selected plants with strings.

Fig. 8—In selecting corn to be saved for seed, choose the most perfect ears.

Some of the seed desirable for saving, because they mature in a single season, are as follows:

Tomato, Cucumber, Squash.

Allow fruit to become slightly over ripe, but not decayed. Scrape out seed pulp, let it soak in its own juice or in water until the seed begin to separate out and settle to the bottom. Then free seed by washing the pulp away and spread it layers to dry

Winter Squash, Pumpkin, Muskmelon, Watermelon.

When fruit is opened for food, select the best formed seed, wash and dry.

Beans, Peas.

Select matured plants with full pods. Pull up, preferably in the early morning. Place plants in a dry, well-aired place until seed are hard. Shell and spread seed in layers to dry

Corn.

Select ripe ears from plant which has produced two good ears. The ears should be well filled with kernels closely set and well developed. Strip down husks and hang ears in a dry, well ventilated place until thoroughly dry. Leave on cob until used.

Lettuce.

When first seed heads open, pull plants, put heads into paper bags and hang in a dry place until seed are ripened and drop out of heads.

Storage of Seeds.

Put heavy seed, such as beans and peas, in cloth bags; smaller seed in paper bags. Label each bag carefully, inside and out, as to contents. To protect seed from mice put the bags in tin boxes. An upstairs room or attic room is a very good place in which to store seed. The room must be dry and well ventilated to prevent molding.

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